

CONTINUOUS BASE-LINE STUDY

✓ **Project 1108-13**

Report 185

A Progress Report

to

FOURDRINIER KRAFT BOARD INSTITUTE, INC.

October 1, 1963

THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

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CONTINUOUS BASE-LINE STUDY

INTRODUCTION

As requested by the Technical Committee of the Fourdrinier Kraft Board Institute, Inc., the reports pertinent to the continuous base-line study on 42-lb. fourdrinier kraft linerboard have been prepared by The Institute of Paper Chemistry on a bimonthly basis instead of the previous monthly basis since August 1, 1961. The current report presents results obtained during the months of August and September, 1963.

PRESENTATION AND DISCUSSION OF TEST RESULTS

Each sample lot received for evaluation during August and September was evaluated for basis weight, caliper, bursting strength, and Elmendorf tearing strength. The average strength results for each mill may be seen in Table I and are graphically presented in Fig. 1 to 5. In addition to a comparison of the current mill averages for the various tests, Table I also shows the current F.K.I. averages, the cumulative F.K.I. averages, and F.K.I. indexes. For each test, the current mill average represents the average obtained on all sample lots evaluated from a given mill during the current period, the current F.K.I. average represents the average of the current mill averages, and the cumulative F.K.I. average represents the average of the current F.K.I. averages for the previous twelve months excluding the current period. The F.K.I. index expressed in per cent is the ratio of the current F.K.I. average to the cumulative F.K.I. average.

In Table II, a tabulation of the number of sample lots submitted by each mill during the current period is shown.

Supplementary to the summary of basis weight data given in Table I, a tabulation is given in Table III of the amount by which the current basis weight average for each mill varies from the 42-lb. specification set forth in Rule 41.

Shown below from Table I are the maximum and minimum current mill averages and also the current and cumulative F.K.I. averages for each test.

TABLE I

SUMMARY OF COMPOSITE MILL AVERAGES--AUGUST AND SEPTEMBER, 1963

Mill	Basis Weight, lb.	Caliper, points	Bursting Strength, p.s.i. gage	In Machine	Elmendorf Tear, g./sheet	Cross Machine
A	43.7	13.2	107	331	388	
B	43.1	12.8	111	341	381	
C	No samples submitted.					
D	43.1	11.3	109	369	416	
E	43.1	12.4	111	310	365	
F	42.0	13.4	107	354	369	
G	No samples submitted.					
H	43.6	12.7	112	336	395	
I	42.4	12.9	111	292	350	
J	42.7	12.6	107	306	362	
K	43.0	12.6	116	314	356	
L	No samples submitted.					
M	42.6	12.6	105	324	345	
N	42.8	12.4	110	369	404	
O	No samples submitted.					
Pa						
Q	42.3	13.0	113	300	352	
S	43.4	12.5	111	322	384	
T ^a						
U	42.8	11.7	113	324	360	
V	43.4	13.3	117	303	357	
W	43.4	12.7	110	382	417	
X	41.9	12.3	109	340	381	
Current FKl average:	42.9	12.6	110	330	375	
Cumulative FKl average:	42.9	12.7	109	332	377	
FKl Index, %	100.0	99.2	100.9	99.4	99.5	

^aCurrent mill averages have been omitted in compliance with Technical Committee's request that current mill averages based on evaluations of fewer than three sample lots of linerboard should be excluded from the summary table and from the calculation of the current FKl averages.

TABLE II

NUMBER OF SAMPLE LOTS SUBMITTED BY EACH MILL
DURING AUGUST AND SEPTEMBER, 1963

Mill Code	Number of Sample Lots
A	3
B	4
C	0
D	9
E	5
F	5
G	0
H	8
I	8
J	16
K	8
L	0
M	6
N	5
O	0
P	2
Q	7
S	9
T	1
U	7
V	8
W	4
X	<u>4</u>
Total	119

TABLE III

PERCENTAGE DEVIATION OF CURRENT MILL AVERAGES
FROM 42-LB. BASIS WEIGHT SPECIFICATION

Mill Code	Percentage Deviation
A	+4.0
B	+2.6
C	----
D	+2.6
E	+2.6
F	0.0
G	----
H	+3.8
I	+1.0
J	+1.7
K	+2.4
L	----
M	+1.4
N	+1.9
O	----
P	+1.0
Q	+0.7
S	+3.3
T	-0.5
U	+1.9
V	+3.3
W	+3.3
X	-0.2

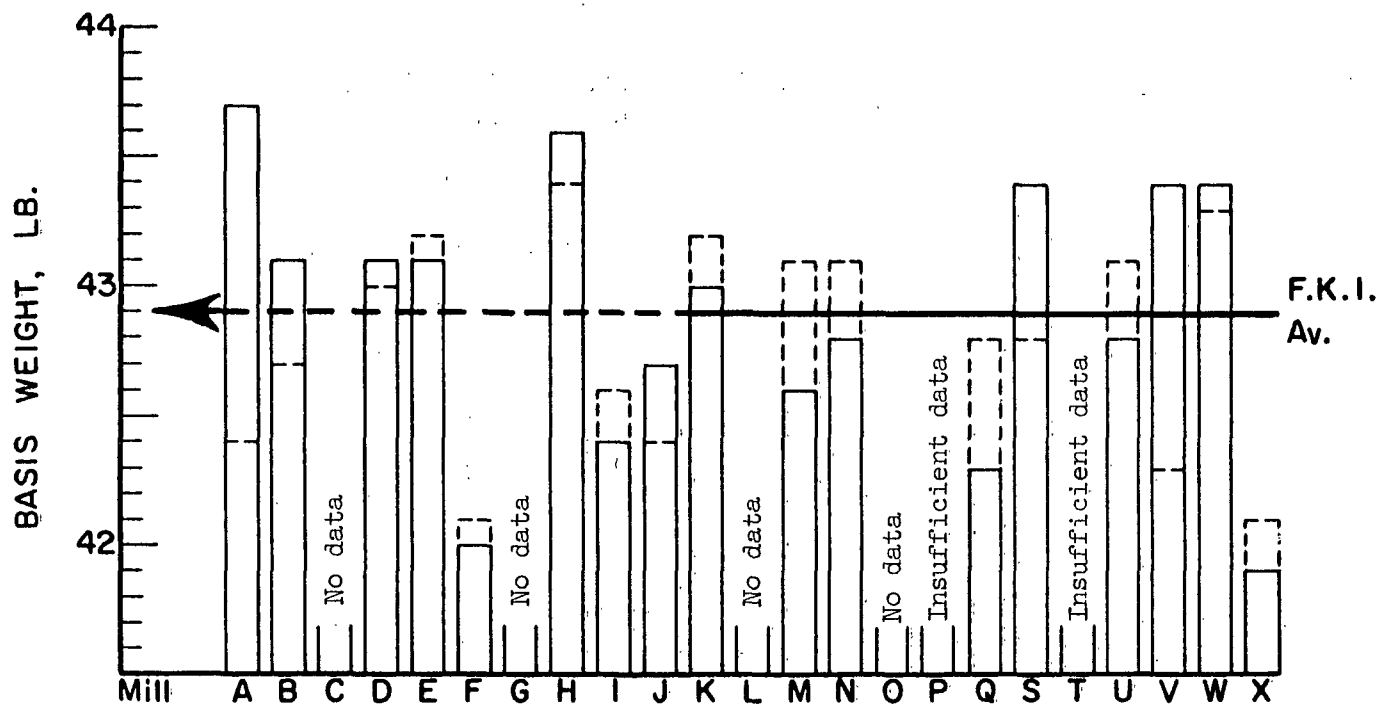


Figure 1. Comparison of Basis Weight Results

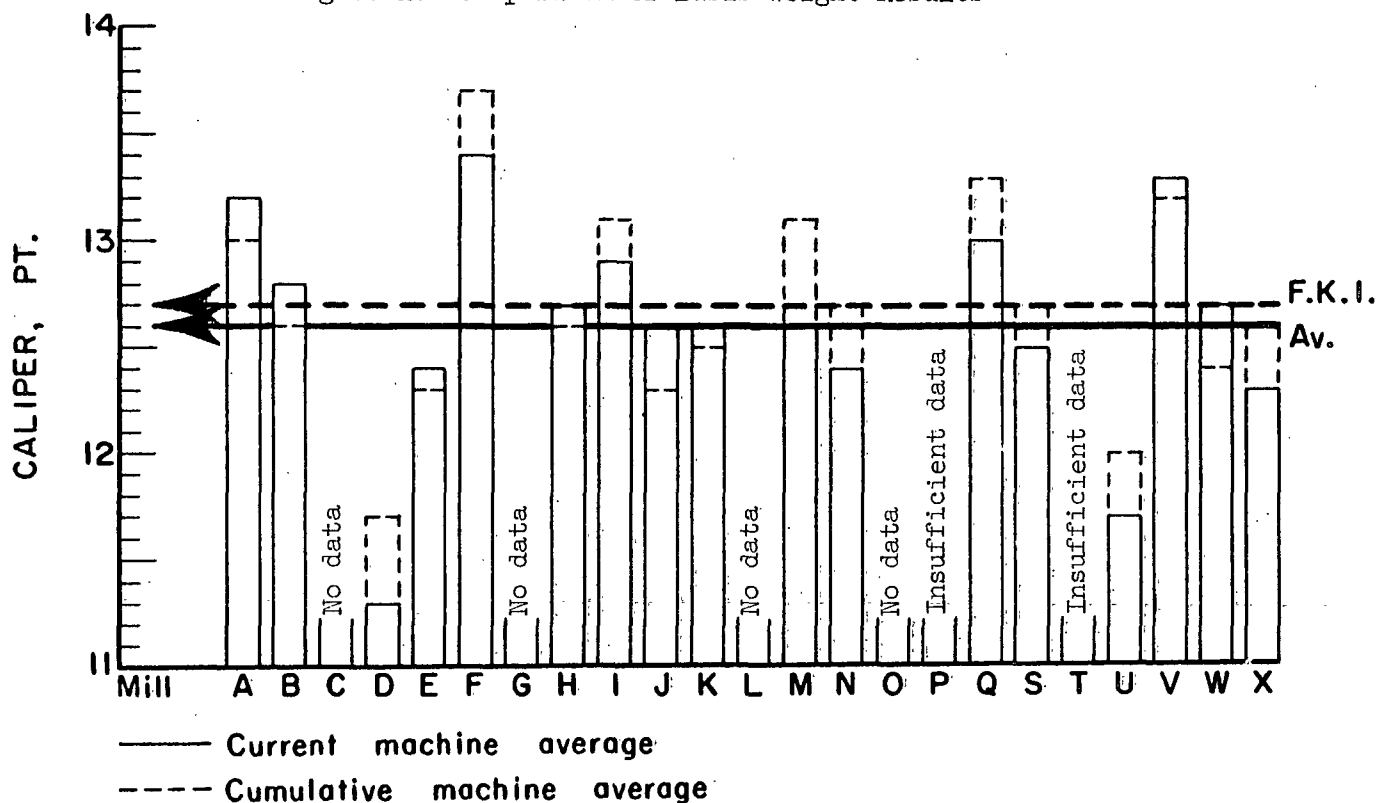


Figure 2. Comparison of Caliper Results

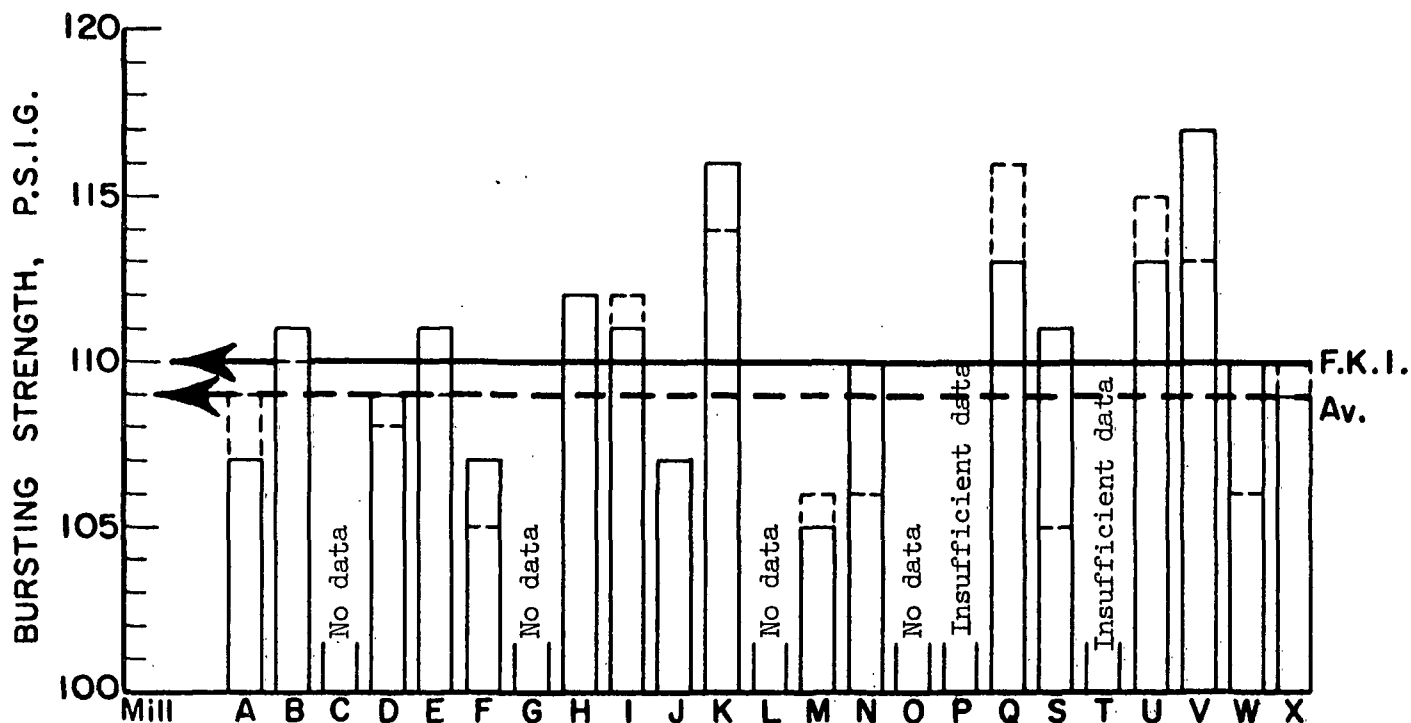


Figure 3. Comparison of Bursting Strength Results

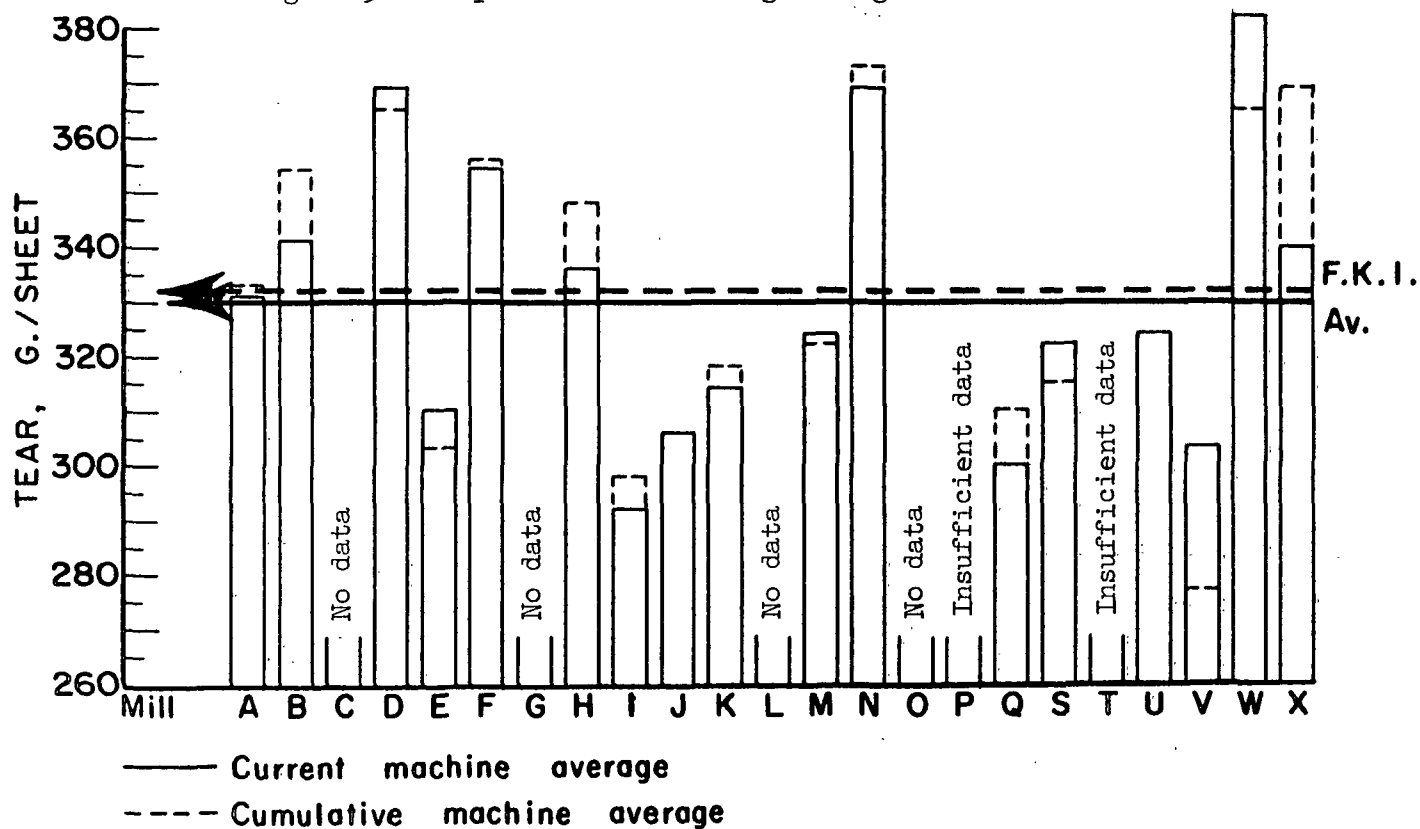


Figure 4. Comparison of Machine-Direction Tear Results

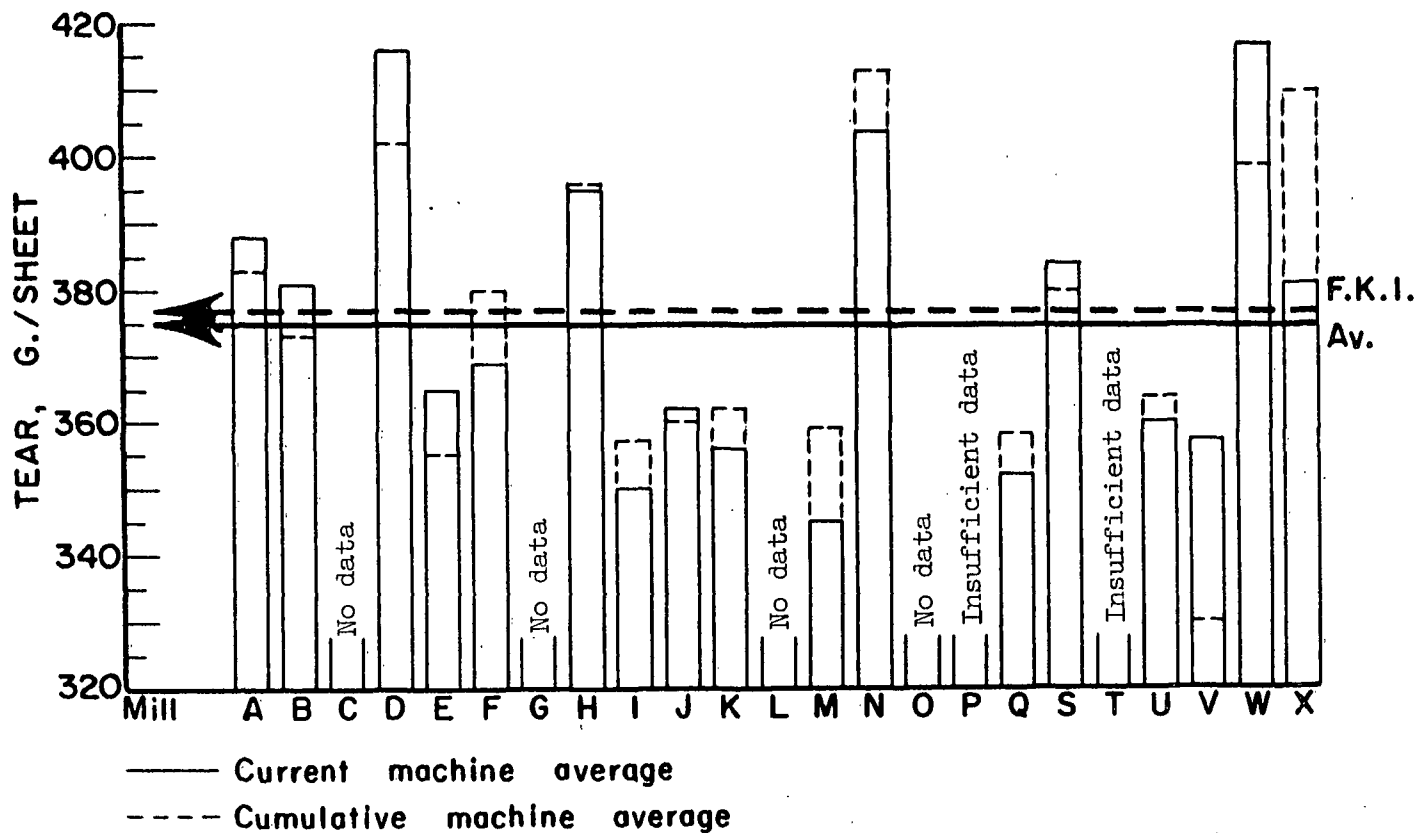


Figure 5. Comparison of Cross-Machine Direction Tear Results

Test	Current Mill Averages		F.K.I. Averages	
	Max.	Min.	Current	Cumulative
Basis weight, lb.	43.7	41.8	42.9	42.9
Caliper, points	13.4	11.3	12.6	12.7
Bursting strength, p.s.i. gage	117	105	110	109
Machine direction Elmendorf tear, g./sheet	382	292	330	332
Cross-machine direction Elmendorf tear, g./sheet	417	345	375	377

The test results obtained at the Institute and at the mill during August and September are given alphabetically in Tables IV to XXVI for each mill. Included in each of these tables are the maximum, minimum, and average test data obtained at the Institute on each sample lot of linerboard. The data obtained at the Institute include also for each test the calculation of (1) a current mill average that represents the mean of the averages obtained on the individual sample lots of linerboard evaluated during the current period, (2) a cumulative mill average that represents the mean of the current mill averages for the previous twelve months excluding the current period, (3) a mill factor expressed in per cent that represents the ratio of the current mill average to the cumulative mill average, and (4) a mill index expressed in per cent that represents the ratio of the current mill average to the cumulative F.K.I. average. The term "mean" in the preceding discussion is synonymous with the simple arithmetic average. As mentioned above, the results presented in Tables IV to XXVI also include data obtained at the mills. The mill data include for each test (1) the average result obtained on each sample lot of linerboard and (2) a current mill average (calculated at the Institute) that represents the mean of the averages obtained on the individual sample lots of linerboard. In addition to the presentations of Institute and mill data described above,

TABLE IV
SUMMARY OF INSTITUTE AND MILL DATA FOR MILL A
August and September, 1963

Date Made	Furnish No.	Basis Weight, lb.			Caliber, points			Bursting Strength, P.S.I. gage			Elmendorf Tear, g./sheet In Machine			Elmendorf Tear, g./sheet Cross Machine												
		Institute	Max.	Min.	Institute	Max.	Min.	Institute	Max.	Min.	Institute	Max.	Min.	Institute	Max.	Min.										
7-29-63	WFLS 1	45.6	42.4	44.1	43.0	-1.1	14.0	12.8	13.3	12.8	-0.5	126	85	109	110	+1	384	264	316	327	+11	432	336	383 ^a	386	+3
8-15-63	WFLS 1	44.6	43.6	44.0	43.6	-0.4	14.0	12.7	13.3	13.1	-0.2	126	95	109	108	-1	384	304	327	343	+16	456	352	401 ^a	395	-6
8-18-63	WFLS 1	43.8	42.0	42.9	42.4	-0.5	13.6	12.3	13.0	12.5	-0.5	120	90	104	107	+3	384	280	349	321	-28	416	336	381 ^a	373	-8
Current mill average:		43.7	43.0	-0.7	13.2	12.8	-0.4	107	108	+1	331	330	-1	388	385	-3										
Cumulative mill average:		42.4			13.0			109			333			383												
Mill factor, %		103.1			101.5			98.2			99.4			101.3												
Mill index, %		101.9			103.9			98.2			99.7			102.9												

TABLE V
SUMMARY OF INSTITUTE AND MILL DATA FOR MILL B

7-19-63	%F.	-	44.6	42.4	43.5	44.2	+0.7	13.7	12.2	12.8	12.7	-0.1	140	92	112	106	-6	384	312	337	335	-2	416	320	378 ^a	377	-1
7-19-63	%F.	-	44.0	41.8	42.7	43.0	+0.3	13.6	11.9	12.8	12.8	0.0	135	95	115	108	-7	400	288	335 ^a	320	-15	448	320	383 ^a	379	-4
8-17-63	%F.	-	44.0	42.2	43.3	43.4	+0.1	13.0	12.5	12.9	12.8	-0.1	137	85	109	112	+3	448	320	360	335	-25	432	336	392 ^a	366	-26
8-17-63	%F.	-	44.0	42.0	42.7	43.2	+0.5	13.0	12.0	12.7	12.9	+0.2	129	85	107	110	+3	376	296	333 ^a	309	-24	416	336	371	363	-8
Current mill average:			43.1	43.5	+0.4			12.8	12.8	0.0				111	109	-2			341	325	-16		381	371		-10	
Cumulative mill average:			42.7					12.6						110					354				373				
Mill factor, %			100.9					101.6						106.9					96.3					102.1			
Mill Index, %			100.5					100.8						101.8					102.7					101.1			

^aThis average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.
Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE VI
SUMMARY OF INSTITUTE AND MILL DATA FOR MILL C

August and September, 1963

Date Made	Finish No.	Mch. No.	Basis Weight, lb.			Caliper, points			Bursting Strength, P.s.i.			Elmendorf Tear, g./sheet		
			Max.	Min.	Av.	Institute	Mill	Diff.	Max.	Min.	Av.	Institute	Mill	Diff.

No samples submitted.

TABLE VII
SUMMARY OF INSTITUTE AND MILL DATA FOR MILL D

7-15-63	W.B.	-	43.8	41.8	42.8	42.2	-0.6	12.1	10.6	11.4	11.2	-0.2	124	92	109	109	0	448	320	380 ^a	353	-27	432	368	403 ^a	384	-19
7-24-63	W.B.	-	44.0	41.8	43.2	42.6	-0.6	12.1	11.0	11.6	11.3	-0.3	125	87	105	108	+3	424	312	371	363	-8	464	384	419 ^a	430	+11
8-18-63	W.B.	-	43.0	42.0	42.4	42.6	+0.2	12.0	10.5	11.3	10.9	-0.4	117	89	105	108	+3	368	288	341	329	-12	440	360	401 ^a	429	+28
8-21-63	W.B.	-	43.0	41.8	42.2	42.2	0.0	11.2	10.0	10.8	10.4	-0.4	128	84	107	110	+3	384	320	354 ^a	347	-7	448	384	417 ^a	408	-9
8-22-63	W.B.	-	44.0	42.0	43.2	43.2	0.0	11.8	10.5	11.2	11.0	-0.2	135	84	112	108	-4	448	336	373 ^a	389	+16	448	352	413 ^a	425	+12
9- 5-63	W.B.	-	43.8	42.0	42.6	42.3	-0.3	11.8	10.9	11.3	11.0	-0.3	125	85	110	111	+1	432	320	359 ^a	339	-20	432	336	392 ^a	399	+7
9- 6-63	W.B.	-	43.8	42.8	43.3	42.5	-0.8	11.4	10.9	11.2	11.1	-0.1	134	95	114	112	-2	432	328	383 ^a	383	0	480	392	437 ^a	423	-14
9- 7-63	W.B.	-	44.4	43.2	44.0	43.3	-0.7	11.8	11.0	11.5	11.2	-0.3	120	86	104	107	+3	464	368	391 ^a	372	-19	480	376	439 ^a	439	0
9-12-63	W.B.	-	44.6	43.0	44.0	43.1	-0.9	12.0	11.2	11.6	11.3	-0.3	139	81	110	108	-2	400	336	369 ^a	353	-16	480	384	426 ^a	436	+10
Current mill average:			43.1	42.7	42.7	42.7	-0.4	11.3	11.3	11.0	11.0	-0.3		109	109	109	0	369	369	359	359	-10		416	416	419	+3
Cumulative mill average:			43.0					11.7						108				365						402			
Mill factor, %			100.2					96.6						100.9				101.1						103.5			
Mill index, %			100.5					89.0						100.0				111.1						110.3			

^aThis average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.
Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE VIII

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL E

August and September, 1963

Date Made	Mch. Finish No.	Basis Weight, lb.			Caliper, points			Bursting Strength, p.s.i.			Elmendorf Tear, g./sheet			Elmendorf Tear, g./sheet														
		Institute		Mill	Institute		Mill	Institute		Mill	Institute		Mill	Institute		Mill												
		Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.												
7-15-63	W.F.	1	44.8	41.6	43.1	42.9	-0.2	13.1	12.0	12.6	12.1	-0.5	129	100	111	111	0	360	248	312	271	-41	416	336	382 ^a	333	-49	
7-27-63	W.F.	1	43.4	40.6	41.9	41.7	-0.2	12.0	11.0	11.6	11.5	-0.1	132	82	106	108	-2	352	264	297 ^a	281	-16	368	304	335 ^a	357	+22	
8-19-63	W.F.	1	44.2	42.0	43.3	43.1	-0.2	13.1	12.1	12.7	12.2	-0.5	137	90	109	113	-4	336	264	305 ^a	285	-20	366	328	353 ^a	357	+4	
9-4-63	W.F.	1	44.0	42.4	43.6	43.0	-0.6	13.0	12.2	12.5	12.0	-0.5	135	83	116	117	+1	384	272	325 ^a	311	-14	416	352	381 ^a	362	-19	
9-12-63	W.F.	1	44.0	42.2	43.4	42.8	-0.6	12.8	12.2	12.5	12.0	-0.5	138	91	115	116	+1	352	272	311 ^a	311	0	416	320	373 ^a	364	-9	
Current mill average:			43.1	42.7	-0.4				12.4	12.0	-0.4			111	113	+2		310	292	-18				365	355	-10		
Cumulative mill average:			43.2						12.3					109				303						355				
Mill factor, %			99.8						100.8					101.8				102.3						102.8				
Mill index, %			100.5						97.6					101.8				99.4						96.8				

^aThis average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE IX

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL F

August and September, 1963

Date Made	Mch. Finish No.	Basis Weight, lb.			Caliper, points			Bursting Strength, p.s.i. gage			Elmendorf Tear, g./sheet In Machine			Elmendorf Tear, g./sheet Cross Machine														
		Institute	Mill	Diff.	Institute	Mill	Diff.	Institute	Mill	Diff.	Institute	Mill	Diff.	Institute	Mill	Diff.												
		Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.												
8-5-63	----	43.6	41.6	42.6	42.3	-0.3	14.1	12.2	13.5	13.1	-0.4	131	90	108	112	+4	440	256	348 ^a	----	----	----	424	304	370 ^a	----	----	----
8-14-63	----	43.4	41.2	42.3	41.9	-0.4	15.8	14.2	14.8	14.1	-0.7	135	64	99	108	+9	440	296	374 ^a	----	----	----	416	344	381 ^a	----	----	----
8-23-63	----	42.2	40.0	41.4	41.6	+0.2	13.5	12.4	13.0	12.7	-0.3	139	83	109	115	+6	384	296	346 ^a	----	----	----	432	304	367 ^a	----	----	----
8-26-63	----	42.2	40.8	41.8	41.9	+0.1	13.8	12.8	13.2	12.8	-0.4	125	93	111	112	+1	400	312	350	----	----	----	400	320	356 ^a	----	----	----
9-13-63	----	42.2	41.0	41.7	41.7	0.0	13.0	12.2	12.5	12.3	-0.2	141	80	110	115	+5	416	296	357 ^a	----	----	----	432	328	373 ^a	----	----	----
Current mill average:		42.0		41.9	-0.1		13.4		13.0	-0.4		107		112	+5		354								369			
Cumulative mill average:		42.1					13.7					105					356								380			
Mill factor, %		99.8					97.8					101.9					99.4								97.1			
Mill index, %		97.9					105.5					98.2					106.6								97.9			

TABLE X

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL G

No samples submitted.

^aThis average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XI

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL #

August and September, 1963

Date Made	Mch. Finish No.	Basis Weight, lb.			Caliber, points			Bursting Strength, p.s.i. range			Elmendorf Tear, g./sheet			Elmendorf Tear, g./sheet												
		Institute	Max. Min.	Av.	Institute	Max. Min.	Av.	Institute	Max. Min.	Av.	Institute	Max. Min.	Av.	Institute	Max. Min.	Av.										
7-16-63	W.F. 3	44.4	42.8	43.7	43.8	+0.1	13.9	12.3	13.2	12.5	-0.7	130	87	107	109	+2	384	320	353	360	+7	448	336	409 ^a	403	-6
7-17-63	W.F. 3	44.0	43.0	43.5	43.7	+0.2	13.2	12.2	12.9	12.6	-0.3	125	83	105	112	+7	416	280	337	354	+17	448	352	390 ^a	405	+15
8-6-63	W.F. 3	44.6	42.8	43.9	43.7	-0.2	13.1	11.6	12.3	12.0	-0.3	133	97	112	113	+1	368	280	314 ^a	334	+20	472	360	392 ^a	383	-9
8-7-63	W.F. 3	44.0	41.6	42.9	42.5	-0.4	13.0	11.9	12.5	12.0	-0.5	130	87	111	110	-1	424	264	341	328	-13	448	352	401 ^a	371	-30
8-27-63	W.F. 3	44.8	43.6	44.2	44.1	-0.1	13.0	12.1	12.6	12.3	-0.3	140	96	119	116	-3	360	288	331	328	-3	544	344	415 ^a	409	-6
8-29-63	W.F. 3	44.4	42.4	43.8	43.8	0.0	13.4	12.0	12.7	12.0	-0.7	134	90	116	115	-1	400	296	341	324	-17	512	352	407 ^a	373	-34
9-6-63	W.F. 3	44.2	43.2	43.9	43.9	0.0	12.8	12.0	12.5	12.5	0.0	139	90	116	115	-1	384	288	321 ^a	316	-5	416	336	377 ^a	387	+10
9-8-63	W.F. 3	44.0	42.0	42.6	42.9	+0.3	12.9	12.0	12.5	12.5	0.0	130	97	111	111	0	416	256	347 ^a	316	-31	408	320	369 ^a	409	+40
Current mill average:		43.6	41.5	-0.1	12.7	12.3	-0.4	112	113	+1	336	333	-3	395	393	-2										
Cumulative mill average:		43.4			12.6			112			348			396												
Mill factor, %		100.5			100.8			100.0			96.6			99.7												
Mill index, %		101.6			100.0			102.8			101.2			104.8												

^aThis average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XII
SUMMARY OF INSTITUTE AND MILL DATA FOR MILL I
August and September, 1963

Date Made	Veh. Finish No.	Basis Weight, lb.			Caliper, points			Bursting Strength, P.S.I., gage			Elmendorf Tear, g./sheet			Elmendorf Tear, g./sheet		
		Max.	Institute	Min.	Max.	Institute	Min.	Max.	Institute	Min.	Max.	Institute	Min.	Max.	Institute	Min.
		Av.	Av.	Diff.	Av.	Av.	Diff.	Av.	Av.	Diff.	Av.	Av.	Diff.	Av.	Av.	Diff.
7-26-63	N.F. 1	42.4	42.0	42.2	42.6	+0.6		13.5	12.6	13.0	13.1	+0.1		312	248	281
7-27-63	N.F. 1	42.6	41.8	42.2	42.9	+0.7		12.0	12.3	12.7	12.0	+0.3		320	256	285 ^a
8-5-63	N.F. 1	42.2	41.6	41.9	42.4	+0.5		11.0	12.4	12.8	11.1	-0.5		320	248	289
8-19-63	N.F. 1	41.8	41.0	41.3	41.0	-0.3		11.5	12.8	13.2	11.2	0.0		320	272	291
8-20-63	N.F. 1	41.6	42.2	41.0	42.7	+0.1		11.0	11.8	13.0	11.1	+0.1		336	240	296
8-20-63	N.F. 1	41.9	42.0	42.5	42.2	-0.2		11.0	12.3	12.5	11.3	-0.3		327	254	297
8-20-63	N.F. 1	42.2	42.2	42.0	42.4	-0.2		11.0	11.5	12.0	11.2	-0.2		320	256	293 ^a
8-20-63	N.F. 1	42.8	42.2	42.4	43.0	+0.6		11.0	12.5	12.5	11.2	-0.2		325	256	294
Current mill average		42.0	42.5	-0.4				12.5	13.1	-0.2				292	263	-29
Cumulative mill average		42.6						11.1						350	349	-1
Mill Caliper, 1		42.0						11.2						357		
Mill Tear, 1		42.5						11.5						350		

^a These averages include the two tests for one of two specimens which were found to be beyond limit.
Note: All current mill average data are calculated from the totals of the individual readings.

TABLE XIII

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL J

August and September, 1963

Date Made	Roll No.	Basis Weight, lb.			Caliber, points			Bursting Strength, P.s.i., gage			Elmendorf Tear, g./sheet In Machine			Elmendorf Tear, g./sheet Cross Machine															
		Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.													
7-16-63	W.F.	1	43.2	42.0	42.2	42.7	42.7	42.7	14.0	11.9	12.7	12.2	-0.5	123	94	106	108	+2	352	280	309 ^a	275	-34	416	320	359 ^a	350	-9	
7-22-63	W.F.	1	44.4	42.4	43.4	43.9	43.9	43.9	13.8	12.1	13.0	12.7	-0.3	132	88	113	114	+1	360	280	327 ^a	292	-35	432	344	378 ^a	390	+12	
7-23-63	W.F.	1	42.2	41.6	42.0	42.2	42.2	42.2	13.2	12.0	12.7	12.3	-0.4	124	83	106	108	+2	368	264	310	293	-17	416	320	363 ^a	383	+20	
7-30-63	W.F.	1	42.6	42.0	42.2	42.7	42.7	42.7	13.3	12.4	13.0	12.7	-0.3	120	86	106	106	0	368	240	302	282	-20	392	304	353 ^a	350	-3	
8-1-63	W.F.	1	43.6	42.2	43.1	43.1	43.1	43.1	13.2	12.3	12.8	12.6	-0.2	125	86	104	106	+2	344	264	305	272	-33	424	320	364 ^a	343	-21	
8-3-63	W.F.	1	43.0	42.0	42.4	42.4	42.4	42.4	13.0	12.0	12.5	12.2	-0.3	132	81	106	108	+2	336	240	292	255	-37	400	320	354 ^a	332	-22	
8-8-11-63	W.F.	1	43.4	42.2	42.7	42.9	42.9	42.9	13.0	11.8	12.3	12.3	0.0	119	100	112	106	-6	400	248	319 ^a	271	-48	400	328	361 ^a	349	-12	
8-14-63	W.F.	1	44.0	42.6	43.4	43.4	43.4	43.4	13.5	12.6	13.0	12.8	-0.2	122	82	104	106	+2	352	272	316	306	-10	440	336	391 ^a	381	-10	
8-23-63	W.F.	1	43.0	42.0	42.3	41.9	41.9	41.9	13.1	12.0	12.6	12.0	-0.6	128	91	106	107	+1	384	232	292 ^a	252	-40	384	320	358 ^a	340	-18	
8-26-63	W.F.	1	44.0	42.0	42.9	42.6	42.6	42.6	13.2	12.1	12.6	12.4	-0.4	126	87	108	109	+1	424	272	305 ^a	296	-9	424	320	373 ^a	374	+1	
8-28-63	W.F.	1	44.0	42.4	43.2	42.8	42.8	42.8	12.9	11.9	12.4	12.2	-0.2	122	86	107	108	+1	384	272	313 ^a	310	-3	400	320	355 ^a	343	-12	
8-31-63	W.F.	1	44.0	42.4	43.2	42.8	42.8	42.8	13.1	12.0	12.7	12.4	-0.3	121	85	109	109	0	352	272	302 ^a	262	-40	384	328	355 ^a	352	-3	
9-4-63	W.F.	1	43.8	42.2	43.1	43.1	43.1	43.1	12.8	12.1	12.4	12.3	-0.1	127	91	106	104	-2	368	272	311 ^a	256	-55	408	320	354 ^a	337	-17	
9-8-63	W.F.	1	42.4	42.0	42.1	42.1	42.1	42.1	13.0	12.2	12.6	12.2	-0.4	122	87	105	105	0	336	264	301 ^a	269	-32	400	312	343 ^a	369	+26	
9-10-63	W.F.	1	44.0	43.0	43.5	43.0	43.0	43.0	12.9	12.0	12.6	12.3	-0.3	125	91	109	110	+1	320	224	290 ^a	264	-26	400	304	353 ^a	305	-48	
9-13-63	W.F.	1	42.2	41.2	41.9	41.6	41.6	41.6	12.0	11.4	11.8	11.9	-0.1	129	89	106	106	0	352	264	307 ^a	261	-46	416	336	377 ^a	338	-39	
Current mill average:			42.7			42.7	42.7	42.7	12.6	12.3	12.3	12.3	-0.3	107		108	108	+1	306			276	-30	362		352	362	352	-10
Cumulative mill average:			42.4			42.4	42.4	42.4	12.3	12.3	12.3	12.3	0.0	107		107	107	0	306			276	-30	360		352	360	352	-10
Mill factor, %			100.7			100.7	100.7	100.7	102.4	102.4	102.4	102.4	100.0	100.0		100.0	100.0	100.0	100.0	100.0			100.0	100.0	100.6		100.6	100.6	100.6
Mill index, %			99.5			99.5	99.5	99.5	99.2	99.2	99.2	99.2	98.2	98.2		98.2	98.2	98.2	98.2	98.2			98.2	98.2	96.0		96.0	96.0	96.0

^aThis average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XIV
SUMMARY OF INSTITUTE AND MILL DATA FOR MILL K
August and September, 1963

Date Grade	Mch. No.	Basis Weight, lb.			Caliber, points			Bursting Strength,			Elmendorf Tear, g./sheet			Elmendorf Tear, g./sheet													
		Institute	Max.	Min.	Institute	Max.	Min.	Institute	Max.	Min.	Institute	Max.	Min.	Institute	Max.	Min.											
8-1-63	N.F.	-	43.6	39.8	42.4	42.7	-0.3	13.2	12.5	13.0	12.2	-0.6	130	95	116	116	0	368	272	311	313	+ 2	384	320	343 ^a	344	+ 1
8-2-63	N.F.	-	43.0	41.0	42.2	42.0	-0.2	13.3	12.1	12.7	12.2	-0.5	121	95	108	110	+2	368	256	306	311	+ 5	368	304	345 ^a	368	-23
8-9-63	N.F.	-	43.6	42.0	42.6	42.6	0.0	14.2	13.1	13.5	13.0	-0.5	131	92	116	107	-9	392	272	313	300	-13	384	320	355 ^a	368	+13
8-16-63	N.F.	-	43.8	42.0	43.0	43.2	+0.2	12.7	11.9	12.3	12.1	-0.2	126	92	113	116	+3	352	264	313 ^a	295	-18	384	336	362 ^a	356	- 6
8-29-63	N.F.	-	44.0	42.2	43.4	43.7	+0.3	12.2	11.9	12.1	11.7	-0.4	135	102	122	114	-8	344	264	309 ^a	283	-26	384	320	351 ^a	337	-14
8-30-63	N.F.	-	44.0	43.2	43.7	43.6	-0.1	12.3	11.9	12.1	11.7	-0.4	130	99	113	115	+2	400	280	319 ^a	308	-11	392	320	345 ^a	353	+ 8
9-13-63	N.F.	-	44.0	43.0	43.6	43.4	-0.2	13.0	12.5	12.8	12.8	0.0	141	96	118	118	0	336	288	315	300	-15	408	352	371 ^a	353	-18
9-20-63	N.F.	-	44.0	42.6	43.5	43.0	-0.5	12.5	11.9	12.1	11.9	-0.2	137	108	119	121	+2	384	304	326	283	-43	416	352	378 ^a	340	-38
Current mill average:			43.0		43.0	43.0	0.0			12.6	12.2	-0.4			116	115	-1			314	299	-15			356	352	- 4
Cumulative mill average:			43.2							12.5					114					318					362		
Mill factor, %			99.5							100.8					101.8					98.7					98.3		
Mill index, %			100.2							99.2					106.4					94.6					94.4		

^aThis average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XV

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL L

August and September, 1963

Date Made	Finish No.	Basis Weight, lb.			Caliper, points			Bursting Strength, P.S.I. range			Elmendorf Tear, g./sheet		
		Max.	Min.	Av.	Institute	Min.	Av.	Max.	Min.	Av.	Institute	Min.	Av.

No samples submitted.

TABLE XVI

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL H

Date Made	Finish No.	Basis Weight, lb.			Caliper, points			Bursting Strength, P.S.I. range			Elmendorf Tear, g./sheet		
		Max.	Min.	Av.	Institute	Min.	Av.	Max.	Min.	Av.	Institute	Min.	Av.
7-21-63	----	43.3	42.4	43.0	43.4	-0.4		13.2	12.1	12.3	12.2	-0.6	118
7-31-63	----	43.0	41.6	42.3	42.5	-0.2		14.2	13.2	13.6	13.0	-0.8	121
8-15-63	----	42.2	40.0	41.1	41.5	-0.4		12.1	11.0	11.6	11.1	-0.5	130
8-16-63	----	44.0	41.2	42.6	42.9	+0.1		13.3	12.3	12.9	12.2	-0.7	130
9- 5-63	----	44.2	42.0	43.2	43.4	-0.2		12.9	12.1	12.5	12.0	-0.5	126
9- 9-63	----	43.6	42.0	43.0	42.9	-0.1		13.0	12.0	12.3	12.0	-0.3	130
Current mill average:			42.6	42.8	-0.2		12.6	12.1	-0.5		105	107	-2
Cumulative mill average:			43.1				13.1				106		
Mill factor, %			96.8				96.2				99.1		
Mill index, %			99.3				99.2				96.3		

This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XVII

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL N

August and September, 1963

Date Made	Finish No.	Mch. No.	Basis Weight, lb.			Caliper, points			Bursting Strength, p.s.i. gauge			Elmendorf Tear, g./sheet In Machine			Elmendorf Tear, g./sheet Cross Machine												
			Institute	Max. Min.	Av.	Institute	Max. Min.	Av.	Institute	Max. Min.	Av.	Institute	Max. Min.	Av.	Institute	Max. Min.	Av.										
7-13-63	N.B.	-	43.4	41.8	42.2	42.4	+0.2	13.1	11.8	12.6	12.2	-0.4	137	86	111	109	-2	392	312	352 ^a	368	+16	424	368	399 ^a	409	+10
7-17-63	N.B.	-	44.0	42.2	43.3	42.7	-0.6	13.8	12.3	13.1	12.6	-0.5	127	81	107	110	+3	415	312	367 ^a	393	-26	472	376	421 ^a	409	-12
8-25-63	N.B.	-	44.0	42.4	43.2	42.6	-0.6	12.4	11.5	11.9	12.0	+0.1	135	95	112	109	-3	400	304	365 ^a	401	+36	480	328	393 ^a	381	-12
9-4-63	N.B.	-	43.0	41.0	41.9	41.6	-0.3	12.6	12.0	12.3	11.8	-0.5	130	86	113	113	0	415	304	368 ^a	381	+13	432	352	368 ^a	349	-39
9-5-63	N.B.	-	44.0	43.0	43.4	42.4	-1.0	13.0	12.0	12.4	12.2	-0.2	134	81	106	110	+4	448	336	393 ^a	425	+32	464	352	419 ^a	404	-15
Current mill average:			42.8	42.4	42.4	42.4	-0.4	12.4	12.2	12.4	12.2	-0.2		110	110	110	0	369	394	394	394	+25		404	391	-13	
Cumulative mill average:			43.1			43.1		12.7			12.7			106				373			373			413			
Mill factor, %			99.3			99.3		97.6			97.6			103.8				98.9			98.9			97.8			
Mill index, %			99.6			99.6		97.6			97.6			100.9				111.1			111.1			107.2			

^aThis average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XVIII

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL O

August and September, 1963

Date Made	Mch. Finish No.	Basis Weight, lb.			Caliper, points			Bursting Strength, P.s.i. 24 gage			Elmendorf Tear, g./sheet			Elmendorf Tear, g./sheet		
		Institute	Max. Min.	AV.	Institute	Max. Min.	AV.	Institute	Max. Min.	AV.	Institute	Max. Min.	AV.	Institute	Max. Min.	AV.

No samples submitted.

TABLE XIX

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL P

5-17-63	WFLS	2	43.8	42.0	42.6	43.1	+0.5	14.0	13.1	13.6	13.1	-0.5	120	85	105	106	+1	352	260	323	345	+22	416	344	386 ^a	421	+35
7-7-63	WFLS	2	43.6	41.0	42.3	42.3	0.0	13.0	12.1	12.7	12.6	-0.1	128	84	104	108	+4	400	288	322 ^a	338	+16	448	352	389 ^a	430	+41
Current mill average:			42.4	42.7	+0.3				13.2	12.9	-0.3			104	107	+3		322	341	+19			388	426	+38		
Cumulative mill average:			42.7						13.4					107				338					390				
Mill factor, %			99.3						98.5					97.2				95.3					99.5				
Mill index, %			98.8						103.9					95.4				97.0					102.9				

^aThis average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE VI

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL C

August and September, 1963

Date Made	Finish No.	Mch. No.	Basis Weight, lb.			Caliber, points			Bursting Strength, P.S.I. Range			Elmendorf Tear, g./sheet In Machine			Elmendorf Tear, g./sheet Cross Machine											
			Institute	Max. Min.	Av.	Institute	Max. Min.	Av.	Institute	Max. Min.	Av.	Institute	Max. Min.	Av.	Institute	Max. Min.	Av.									
8-1-63	WFIS	2	44.0	42.0	43.0	43.3	44.6	42.9	13.6	13.5	-0.1	143	86	111	112	366	272	311 ^a	300	-11	400	320	359 ^a	390	+21	
8-8-63	WFIS	2	42.4	41.6	42.1	43.2	43.6	42.2	12.7	12.7	0.0	146	91	120	114	-6	344	248	286 ^a	295	+9	400	328	363 ^a	388	+25
8-16-63	WFIS	2	43.6	42.0	42.4	43.3	44.0	43.2	13.7	13.4	-0.3	135	89	114	111	-3	368	232	293 ^a	314	+21	392	344	369 ^a	412	+43
8-26-63	WFIS	2	43.0	42.2	42.6	43.0	42.9	42.0	12.4	12.6	+0.2	139	94	116	114	-2	352	256	300 ^a	332	+32	400	320	349 ^a	406	+57
9-3-63	WFIS	2	42.0	41.0	41.6	42.0	43.0	42.6	12.9	13.0	+0.1	126	78	105	103	-2	360	240	304 ^a	338	+24	368	288	321 ^a	400	+79
9-9-63	WFIS	2	43.6	42.0	42.3	43.0	43.0	42.5	12.8	12.8	0.0	142	88	116	112	-4	368	248	305 ^a	331	+26	400	320	359 ^a	404	+45
9-16-63	WFIS	2	43.6	42.0	42.4	43.2	42.9	42.4	12.7	13.0	+0.3	133	76	109	108	-1	336	240	303 ^a	348	+45	368	320	341 ^a	390	+49
Current mill average:			42.3		43.0	+0.7		13.0	13.0	0.0		113	111	-2			300	323	+23				352	399	+47	
Cumulative mill average:			42.6					13.3				116					310						358			
Mill factor, %			98.6					97.7				96.8					98.3						98.3			
Mill index, %			98.6					102.4				90.4					93.4						93.4			

^a This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XVI

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL S
August and September, 1963

Date Made	Mch. Finish No.	Basis Weight, lb.			Caliber, points			Bursting Strength, P.S.I. ² /sq. in.			Elmendorf Tear, g./sheet			Elmendorf Tear, g./sheet													
		Institute	Max.	Min.	Institute	Max.	Min.	Institute	Max.	Min.	Institute	Max.	Min.	Institute	Max.	Min.											
7-23-63	WFIS 1	43.6	41.8	42.6	42.3	-0.3	13.3	11.9	12.5	12.4	-0.1	127	89	106	105	-1	384	280	324	347	+23	384	336	360 ^a	417	+57	
7-31-63	WFIS 1	44.8	42.6	43.7	43.7	0.0	13.1	11.1	12.4	12.3	-0.1	134	100	115	109	-6	384	256	325	372	-47	432	336	394 ^a	427	+33	
8- 7-63	WFIS 1	44.2	42.2	43.3	43.5	+0.2	12.8	11.9	12.3	12.3	0.0	139	85	114	105	-9	384	304	339	356	+17	400	352	377 ^a	440	+63	
8-14-63	WFIS 1	44.4	42.0	43.5	42.8	-0.7	13.3	12.3	12.8	12.6	-0.2	124	87	107	107	0	384	288	313 ^a	319	+6	440	344	389 ^a	367	-2	
8-22-63	WFIS 1	44.2	42.2	43.7	43.4	-0.3	13.1	12.0	12.5	12.5	0.0	140	83	113	111	-2	400	240	313 ^a	336	+23	448	320	385 ^a	418	+33	
8-29-63	WFIS 1	44.2	43.0	43.4	43.4	0.0	13.3	12.2	12.8	12.7	-0.1	125	79	110	106	-4	368	224	304	331	+27	448	312	378 ^a	412	+34	
9- 4-63	WFIS 1	44.0	42.2	43.3	42.8	-0.5	13.0	11.9	12.5	12.7	+0.2	130	92	111	106	-5	360	296	323	335	+12	416	368	385 ^a	417	+32	
9-11-63	WFIS 1	44.0	42.4	43.6	43.3	-0.3	12.8	11.9	12.3	12.4	+0.1	130	95	112	109	-3	376	304	338 ^a	323	-15	464	352	395 ^a	403	+8	
9-17-63	WFIS 1	44.0	42.4	43.7	43.5	-0.2	13.0	12.2	12.6	12.8	-0.2	130	93	110	111	+1	376	240	322 ^a	331	+9	448	360	390 ^a	412	+22	
Current mill average:		43.4	43.2	-0.2				12.5	12.5	0.0			111	108	-3			322	339	+17			384	415	+31		
Cumulative mill average:		42.8						12.7					105					315					380				
Mill factor, %		101.4						98.4					105.7					102.2					101.1				
Mill index, %		101.2						98.4					101.8					97.0					101.9				

^aThis average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XXII
SUMMARY OF INSTITUTE AND MILL DATA FOR MILL T
August and September, 1963

Date Made	Sch. Finish No.	Basis Weight, lb.			Caliper, points			Bursting Strength, P.S.I., Edge			Elmendorf Tear, g./sheet In Machine			Cross Machine												
		Institute	Max.	Min.	Institute	Max.	Min.	Institute	Max.	Min.	Institute	Max.	Min.	Institute	Max.	Min.										
8-2-63	S.F. 7	43.0	40.2	41.6	41.9	+0.1	13.6	12.3	12.6	12.9	+0.1	129	78	105	101	4	400	256	300	350	+50	392	336	357 ^a	383	+26
Current mill average:		41.8	41.9	+0.1	12.8	12.9	+0.1	105	101	4	300	350	+50	357	383	+26										
Cumulative mill average:		42.2	12.4	101	344									385												
Mill factor, %		99.1	103.2	104.0	87.2									92.7												
		97.4	100.8	96.3	90.4									94.7												

TABLE XXIII
SUMMARY OF INSTITUTE AND MILL DATA FOR MILL U

7-26-63	W.F.S 1	44.0	42.6	43.6	43.0	-0.6	12.2	11.8	12.0	11.6	-0.4	125	97	112	115	+3	448	304	364 ^a	335	-29	448	352	383 ^a	373	-10
7-25-63	W.F. 1	44.2	43.2	43.7	43.3	-0.4	12.1	11.3	11.9	11.6	-0.3	127	89	112	116	+4	448	288	371	332	-39	400	336	371 ^a	366	-5
8-1-63	W.F.S 2	42.8	41.4	42.0	42.0	0.0	11.8	11.0	11.4	11.0	-0.4	131	97	115	114	-1	344	256	295	278	-17	416	320	351 ^a	328	-23
8-1-63	W.F.S 2	42.2	40.4	41.7	41.9	+0.2	11.8	11.1	11.3	11.0	-0.3	125	95	114	112	-2	336	248	292	272	-20	400	320	351 ^a	312	-39
8-24-63	W.F.S 2	43.2	41.8	42.5	42.1	-0.4	12.2	11.6	11.9	11.3	-0.6	133	90	113	115	+2	336	264	303	273	-30	400	312	349 ^a	313	-36
8-24-63	W.F.S 2	44.0	42.0	42.9	42.3	-0.6	12.0	11.0	11.5	11.4	-0.1	137	97	111	114	+3	368	288	318	287	-31	400	320	347 ^a	319	-28
9-20-63	W.F. 2	44.0	43.0	43.6	42.9	-0.7	11.9	11.2	11.5	11.1	-0.4	129	91	111	112	+1	400	240	325 ^a	279	-46	400	352	371 ^a	314	-57
Current mill average:				42.8	42.5	-0.3		11.7	11.3	-0.4			113	114	+1			324	294	-30			360	332	-28	
Cumulative mill average:				43.1				12.0					115					324					364			
Mill factor, %				99.1				97.5					98.3					100.0					96.9			
Mill index, %				97.8				92.1					103.7					97.6					95.5			

^aThis average includes the readings for one or more specimens which were beyond the 18-inch limit.
Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XXIV

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL V

August and September, 1963

Date Made	Kch. Finish No.	Basis Weight, lb.			Caliber, points			Bursting Strength, p.s.i. gage			Elmendorf Tear, g./sheet			Cross Machine												
		Institute	Max.	Min.	Av.	Institute	Max.	Min.	Av.	Institute	Max.	Min.	Av.	Institute	Max.	Min.	Av.									
6-28-63	WFLS 1	43.0	41.8	42.4	42.2	-0.2	13.6	12.7	13.1	12.9	-0.2	131	100	117	121	44	352	256	301	288	-13	368	336	350 ^a	372	+22
7-4-63	WFLS 1	44.0	42.8	43.6	43.5	-0.1	14.2	13.3	13.8	13.5	-0.3	128	83	109	113	44	312	256	287 ^a	301	+14	384	320	353 ^a	381	+28
7-24-63	WFLS 1	44.0	43.0	43.7	43.0	-0.7	13.7	13.0	13.2	13.4	+0.2	135	98	120	120	0	312	256	280	319	+39	384	344	359 ^a	413	+54
8-1-63	WFLS 1	43.4	42.2	42.7	42.5	-0.2	13.9	12.9	13.3	13.4	+0.1	142	107	125	124	-1	352	256	291	299	+8	392	320	359 ^a	382	+23
8-13-63	WFLS 1	44.2	43.8	44.0	43.3	-0.7	14.2	13.1	13.8	13.6	-0.2	138	94	116	116	0	400	264	315 ^a	303	-12	384	288	351 ^a	385	+34
8-22-63	WFLS 1	44.0	42.6	43.3	43.2	-0.1	13.6	13.0	13.2	13.3	+0.1	141	104	123	122	-1	336	240	302	296	-6	400	336	364 ^a	386	+22
9-8-63	WFLS 1	44.0	42.6	43.6	43.0	-0.6	13.1	12.9	13.0	12.6	-0.4	126	85	113	117	44	384	272	327 ^a	324	-3	384	336	351 ^a	378	+27
9-9-63	WFLS 1	43.8	43.4	43.7	43.3	-0.4	13.0	12.6	13.0	12.5	-0.5	132	94	111	116	+5	352	272	321 ^a	331	+10	432	320	365 ^a	376	+13
Current mill average:		43.4	43.0	-0.4	13.3	13.1	-0.2	117	119	+2	303	306	+5	357	385	+28										
Cumulative mill average:		42.3			13.2			113			277			330												
Mill factor, %		102.6			100.8			103.5			109.4			108.2												
Mill index, %		101.2			104.7			107.3			91.3			94.7												

^aThis average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XXV

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL #

August and September, 1963

Date Made	Mch. No.	Basis Weight, lb.				Caliber, points				Bursting Strength, p.s.i. gauge				Elmendorf Tear, g./sheet In Machine				Elmendorf Tear, g./sheet Cross Machine								
		Institute		Mill		Institute		Mill		Institute		Mill		Institute		Mill		Institute		Mill						
		Max.	Min.	Av.	Diff.	Max.	Min.	Av.	Diff.	Max.	Min.	Av.	Diff.	Max.	Min.	Av.	Diff.	Max.	Min.	Av.	Diff.					
8-7-63	----	2	43.8	42.2	43.0	42.4	-0.6	12.8	12.1	12.4	12.5	-0.1	134	73	109	112	-3	424	344	378 ^a	----	488	352	408 ^a	----	
8-8-63	----	2	44.6	42.4	43.3	42.6	-0.5	12.6	11.8	12.2	12.2	0.0	126	92	110	114	+4	416	352	383 ^a	----	488	400	435 ^a	----	
8-13-63	----	1	44.4	43.0	43.8	43.0	-0.8	13.6	12.1	12.9	12.7	-0.2	139	100	118	115	-3	472	344	400 ^a	----	456	360	423 ^a	----	
8-14-63	----	1	44.4	42.4	43.6	42.6	-0.8	13.6	12.9	13.2	13.2	0.0	119	82	102	106	+4	400	328	369 ^a	----	440	344	401 ^a	----	
Current mill average:			43.4	42.7	-0.7		12.7	12.7	0.0		110	112	+2		362				365				417			
Cumulative mill average:			43.3				12.4				106												399			
Mill factor, %			100.2				102.4				103.8				104.7								104.5			
Mill Index, %			101.2				100.0				100.9				115.1								110.6			

^aThis average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XXVI
SUMMARY OF INSTITUTE AND MILL DATA FOR MILL X
August and September, 1963

Date Made	Mch. No.	Finish	Basis Weight, lb.			Caliper, points			Bursting Strength, P.S.I. gage			Elmendorf Tear, g./sheet In Machine			Elmendorf Tear, g./sheet Cross Machine												
			Institute	Max.	Min.	Institute	Max.	Min.	Institute	Max.	Min.	Institute	Max.	Min.	Institute	Max.	Min.										
			Av.	Diff.		Av.	Diff.	Av.	Diff.	Av.	Diff.	Av.	Diff.	Av.	Diff.	Av.	Diff.										
7-15-63	WFIS	1	42.0	40.0	41.3	40.9	-0.4	12.2	10.2	11.3	11.2	-0.1	133	102	118	130	+12	352	272	313	288	-25	448	336	379 ^a	336	-41
7-25-63	WFIS	1	42.0	40.0	41.4	40.8	-0.6	13.2	11.9	12.5	12.0	-0.5	130	84	107	121	+14	400	280	342	285	-57	400	344	377 ^a	329	-48
8-5-63	WFIS	1	43.8	42.0	42.8	42.7	-0.1	14.0	12.0	12.6	12.6	-0.2	131	82	103	119	+16	400	312	359	340	-19	448	352	399 ^a	383	-16
9-11-63	WFIS	1	42.2	41.2	42.0	41.5	-0.5	13.0	12.1	12.5	12.3	-0.2	129	83	107	109	+2	432	272	345 ^a	317	-28	400	352	367 ^a	345	-22
Current mill average:			41.9	41.5	41.5	-0.4		12.3	12.0	12.3	12.0	-0.3	109	120	110	120	+11		340	307	307	-33		381	349	-32	
Cumulative mill average:			42.1					12.6											369					410			
Mill factor, %			99.5					97.6											92.1					92.9			
Mill index, %			97.7					96.9											102.4					101.1			

^aThis average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.
Note: All "current mill average" data are calculated from the totals of the individual readings.

Tables IV through XXVI also include under each test heading a column labeled "Diff.:" This column shows the differences between averages obtained at the Institute and those obtained at the mills. The data obtained at the Institute are used as the reference in calculating these differences.

The average test results obtained at the Institute and at the mills are summarized in Table XXVII for the current period. Shown in this table for each mill is the difference for each test between the current mill average based on Institute data and the current mill average based on mill data. In addition, for each test the maximum difference encountered in comparing Institute and mill averages for individual sample lots is shown. In Table XXVIII, the differences for each test between the current mill averages based on Institute data and those based on mill data shown in Table XXVII have been converted to per cent (based on Institute data as a reference). In addition, for purposes of comparison, the percentage differences from the previous bimonthly report are shown in Table XXVIII.

A summary of the agreement obtained in the comparisons of Institute and mill test data for the current period is shown in Table XXIX. This summary is based on the results given in Table XXVIII. The tabulated data show the number of mills, and the percentage of all mills which this number represents, whose average test results for the current period fall within designated percentages from the average test results obtained at the Institute. It may be noted from this summary that agreement between the results obtained at the Institute and those obtained at the mills was generally very good.

Preconditioning and conditioning data pertinent to the test results obtained at the mills during the current period are given in Table XXX.

TABLE XXVII
SUMMARY OF TEST RESULT COMPARISONS (AVERAGE MILL AND INSTITUTE RESULTS) FOR AUGUST AND SEPTEMBER, 1963

Mills ^a	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	S	T	U	V	W	X
No. of samples compared	3	4	0	9	5	5	0	8	8	16	8	0	6	5	0	2	7	9	1	7	8	4	4
Institute	43.7	43.1		43.1	43.1	42.0		43.6	42.4	42.7	43.0		42.6	42.8		42.4	42.3	43.4	41.8	42.8	43.4	43.4	41.9
Mill	43.0	43.5		42.7	42.7	41.9		43.5	42.8	42.7	43.0		42.8	42.4		42.7	43.0	43.2	41.9	42.5	43.0	42.7	41.5
Av. diff. ^b	-0.7	+0.4		-0.4	-0.4	-0.1		-0.1	+0.4	0.0	0.0		+0.2	-0.4		+0.3	+0.7	-0.2	+0.1	-0.3	-0.4	-0.7	-0.4
Max. diff. ^c	-1.1	+0.7		-0.9	-0.6	-0.4		-0.4	+0.7	+0.5	-0.5		+0.4	-1.0		+0.5	+1.1	-0.7	+0.1	-0.7	-0.7	-0.8	-0.6
Institute	13.2	12.8		11.3	12.4	13.4		12.7	12.9	12.6	12.6		12.6	12.4		13.2	13.0	12.5	12.8	11.7	13.3	12.7	12.3
Mill	12.8	12.8		11.0	12.0	13.0		12.3	13.1	12.3	12.2		12.1	12.2		12.9	13.0	12.5	12.9	11.3	13.1	12.7	12.0
Av. diff. ^b	-0.4	0.0		-0.3	-0.4	-0.4		-0.4	+0.2	-0.3	-0.4		-0.5	-0.2		-0.3	0.0	0.0	+0.1	-0.4	-0.2	0.0	-0.3
Max. diff. ^c	-0.5	+0.2		-0.4	-0.5	-0.7		-0.7	+0.5	-0.6	-0.8		-0.8	-0.5		-0.5	+0.3	+0.2	+0.1	-0.6	-0.5	-0.2	-0.5
Institute	107	111		109	111	107		112	111	107	116		105	110		104	113	111	105	113	117	110	109
Mill	108	109		109	113	112		113	114	108	115		107	110		107	111	108	101	114	119	112	120
Av. diff. ^b	+1	-2		0	+2	+5		+1	+3	+1	-1		+2	0		+3	-2	-3	-4	+1	+2	+2	+11
Max. diff. ^c	+3	-7		-4	+4	+9		+7	+7	-6	-9		+6	+4		+4	-6	-9	-4	+4	+5	+4	+16
Institute	331	341		369	310	354		336	292	306	314		324	369		322	300	322	300	324	303	382	340
Mill	330	325		359	292	---		333	263	276	299		301	394		341	323	339	350	294	308	---	307
Av. diff. ^b	-1	-16		-10	-18	---		-3	-29	-30	-15		-23	+25		+19	+23	+17	+50	-30	+5	---	-33
Max. diff. ^c	-28	-25		-27	-41	---		-31	-56	-55	-43		-41	+36		+22	+45	+47	+50	-46	+39	---	-57
Institute	388	381		416	365	369		395	350	362	356		345	404		388	352	384	357	360	357	417	381
Mill	385	371		419	355	---		393	349	352	352		342	391		426	399	415	383	332	385	---	349
Av. diff. ^b	-3	-10		+3	-10	---		-2	-1	-10	-4		-3	-13		+38	+47	+31	+26	-28	---	---	-32
Max. diff. ^c	-8	-26		+28	-49	---		+40	+29	-48	-38		-17	-39		+41	+79	+63	+26	-57	+54	---	-48

^aComparison based on averages involved only those samples on which mill test data were submitted.

^bAverage difference is the difference between the Institute mill average and the mill average based on mill test data.

^cMaximum difference encountered in comparing the Institute average and the mill averages for any sample submitted by that particular mill.

TABLE XXVIII
COMPARISON OF INSTITUTE-MILL DIFFERENCES FOR AUGUST AND SEPTEMBER, 1963
(Average difference, per cent)

Mill	Period	Basis Weight	Caliper	Bursting Strength	Tear, in	Tear, cross	Mill	Period	Basis Weight	Caliper	Bursting Strength	Tear, in	Tear, cross
A	Apr-May June-July Cur.	-0.5 +0.2 -2	-4 -4 -3	-2 -4 +0.9	-8 +2 -0.3	-4 -1 -0.8	M	Apr-May June-July Cur.	+2 +2 +0.5	-3 -3 -4	0 +1 +2	-6 -7 -7	-2 -3 -0.9
B	Apr-May June-July Cur.	+0.9 +1 +0.9	-0.8 -2 0	-2 +2 -2	-7 -8 -5	+2 -1 -3	N	Apr-May June-July Cur.	-0.5 +0.2 -0.9	-2 -3 -2	+0.9 -0.9 0	+6 +13 +7	+5 +5 -3
C	Apr-May June-July Cur.	-----	-----	-----	-----	-----	O	Apr-May June-July Cur.	0 +0.5 -----	0 -2 -----	+3 -2 -----	-4 -1 -----	+0.8 +2 -----
D	Apr-May June-July Cur.	-0.5 0 -0.9	-3 -3 -3	+5 0 0	-10 -7 -3	-1 -0.7 +0.7	P	Apr-May June-July Cur.	0 -0.7 +0.7	-3 -4 -2	+4 -2 +3	+4 -0.3 +6	+10 +10 +10
E	Apr-May June-July Cur.	-0.7 -0.7 -0.9	-2 -3 -3	+3 +0.9 +2	-7 -8 -6	-2 -3 -3	Q	Apr-May June-July Cur.	+2 +1 +2	-2 -3 0	-3 -5 -2	-3 -5 +8	+8 +8 +13
F	Apr-May June-July Cur.	-----	-----	-----	-----	-----	S	Apr-May June-July Cur.	+0.2 -0.2 -0.5	-2 -2 0	-0.9 -2 -3	-2 -1 +5	+4 +5 +8
G	Apr-May June-July Cur.	-----	-----	-----	-----	-----	T	Apr-May June-July Cur.	+1 +1 +0.2	0 -0.8 +0.8	+1 -2 -4	+9 +6 +17	+7 +5 +7
H	Apr-May June-July Cur.	+0.9 +0.7 -0.2	-3 -5 -3	+3 +2 +0.9	-3 -5 -0.9	+3 +2 -0.5	U	Apr-May June-July Cur.	+0.2 +0.7 -0.7	-2 -0.8 -3	+2 +4 +0.9	-4 +2 -9	0 +0.5 -8
I	Apr-May June-July Cur.	+0.5 -0.5 +0.9	+2 +0.8 +2	+2 +2 +3	-13 -12 -10	-2 -2 -0.3	V	Apr-May June-July Cur.	+0.5 0 -0.9	-2 -2 -2	+4 +3 +2	+0.7 -3 +2	+8 +7 +8
J	Apr-May June-July Cur.	+0.5 +0.7 0	-2 -2 -2	+3 +0.9 +0.9	-8 -12 -10	+2 -2 -3	W	Apr-May June-July Cur.	-0.5 -1 -2	-0.8 -2 0	-2 +0.9 +2	----- ----- -----	----- ----- -----
K	Apr-May June-July Cur.	-0.9 -0.2 0	-3 -2 -3	0 -3 -0.9	-7 -5 -5	-7 -4 -1	X	Apr-May June-July Cur.	-0.2 +0.5 -1	-3 -2 -2	+14 +10 +10	-18 -13 -10	-12 -9 -8
L	Apr-May June-July Cur.	-----	-----	-----	-----	-----							

TABLE XXIX

SUMMARY OF AGREEMENT BETWEEN INSTITUTE AND MILL RESULTS FOR AUGUST AND SEPTEMBER, 1963^a

Average Percentage Difference Between Institute and Mill Test Results										
	+0.5	+1	+2	+3	+4	+5	+7.5	+10	+17	
Basis weight										
Number of mills	7	16	19							
Percentage of all mills	36.8	84.2	100.0							
Caliper										
Number of mills	4	5	11	18	19					
Percentage of all mills	21.1	26.3	57.9	94.7	100.0					
Bursting strength										
Number of mills	2	7	13	16	17	18	18	19		
Percentage of all mills	10.5	36.8	68.4	84.2	89.5	94.7	94.7	100.0		
Tearing strength, in										
Number of mills	1	2	3	4	4	7	11	16	17	
Percentage of all mills	5.9	11.8	17.6	23.5	23.5	41.2	64.7	94.1	100.0	
Tearing strength, cross										
Number of mills	2	6	6	10	10	10	11	16	17	
Percentage of all mills	11.8	35.3	35.3	58.8	58.8	58.8	64.7	94.1	100.0	

^aBased on the average percentage differences between Institute and mill data given in Table XXVIII.

TABLE XXX

PRECONDITIONING AND CONDITIONING DATA FOR MILL TESTS

August and September, 1963

MILL Code	Preconditioning			Conditioning		
	R.H., %	Temp., °F.	Time, hr.	R.H., %	Temp., °F.	Time, Hr.
A	50	73	24	50	73	24
B	----	----	----	50	73	24
C ^a	----	----	----	----	----	----
D	----	----	----	50-55	73-74	48
E	42-97	84-90	0.5	50	73	24
F	----	----	----	50-59	71-78	4-84
G ^a	----	----	----	----	----	----
H	----	----	----	50	73-75	24
I	----	----	----	57-74	75-97	----
J	35	73	48	50	73	48
K ^a	33-36	76-78	8	48-52	71-73	16
L	----	----	----	----	----	----
M	50	74-78	48	50	74-78	3
N	----	----	----	50	73	48
O ^a	----	----	----	----	----	----
P	50	72	120	50	72	120
Q	50	72	24	----	----	----
S	----	----	----	55-56	71-72	----
T	50	73	24	----	----	----
U	49-50	71-72	0-24	49-50	71-72	24
V	50	73	72-120	50	73	72-120
W	----	----	----	50	73	24
X	50	70-72	24-360	50	72	24

^aNo samples were submitted for evaluation during the current period.

THE INSTITUTE OF PAPER CHEMISTRY



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